

WHAT IS CLAIMED IS:

1. A vitrified bond tool comprising:
a support body;
a vitrified bond layer which is formed on a working surface of said support body; and
a plurality of abrasive grains which are held by said vitrified bond layer so as to be fixed relative to said working surface of said support body and which are spaced apart from each other with spacing between the adjacent ones of said abrasive grains, each of the plurality of abrasive grains positioned so that each of the abrasive grains is bonded at an increased area thereof to the vitrified bond layer.
2. A vitrified bond tool according to claim 1, wherein said abrasive grains are positioned relative to each other in a direction parallel to said working surface of said support body.
3. A vitrified bond tool according to claim 1, wherein said abrasive grains are positioned relative to each other such that an average distance between centers of the adjacent ones of said abrasive grains is not smaller than 1.5 times as large as an average diameter of said abrasive grains.
4. A vitrified bond tool according to claim 3, wherein said average distance is 1.8-10 times as large as said average diameter.

5. A vitrified bond tool according to claim 1, wherein at least ones of said abrasive grains, which have a diameter smaller than an average diameter of said abrasive grains, are partially embedded in said vitrified bond layer, without being contact with said working surface of said support body.

6. A vitrified bond tool according to claim 1, wherein said abrasive grains protrude from said vitrified bond layer.

7. A vitrified bond tool according to claim 1, wherein said abrasive grains protrude from a surface of said vitrified bond layer such that a distance over which each one of said abrasive grains protrudes from the surface of said vitrified bond layer corresponds to 20-70% of a diameter of said each one of said abrasive grains.

8. A vitrified bond tool according to claim 1, wherein at least 30% of the total number of said abrasive grains are separated from said support body by portions of said vitrified bond tool which have thickness not smaller than 5% of an average diameter of said abrasive grains.

9. A vitrified bond tool according to claim 1, wherein said abrasive grains cooperate with each other to form a single layer.

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10. A vitrified bond tool according to claim 1, further comprising a base, and wherein said support body is bonded to said base.

11. A vitrified bond tool according to claim 1, wherein said abrasive grains are positioned relative to each other so as to be dotted on said working surface of said support body.

12. A vitrified bond tool according to claim 1, wherein said abrasive grains are positioned relative to each other such that said spacing between the adjacent ones of said abrasive grains is held in a predetermined range.

13. A vitrified bond tool according to claim 1, wherein said abrasive grains are positioned relative to each other by a precursor of said vitrified bond layer.

14. A method of manufacturing the vitrified bond tool as defined in claim 1, comprising the steps of :

forming a pattern layer, as a precursor of said vitrified bond layer, in a predetermined pattern on said working surface of said support body, said pattern layer including a vitrified bond;

sprinkling said abrasive grains over said pattern layer before said pattern layer is dried; and

firing said pattern layer and said abrasive grains which adhere to said pattern layer and are arranged in said predetermined pattern on said working surface of said support body.

15. A method according to claim 14, wherein said pattern layer is printed on said working surface of said support body so as to be dotted on said working surface of said support body, so that said pattern layer is formed in a dotted pattern on said working surface of said support body.

16. A method of manufacturing the vitrified bond tool as defined in claim 6, comprising the steps of:

forming a pattern layer, as a precursor of said vitrified bond layer, in a predetermined pattern on said working surface of said support body, said pattern layer including a vitrified bond;

sprinkling said abrasive grains over said pattern layer before said pattern layer is dried;

bringing protruding ends of said abrasive grains which adhere to said pattern layer, into contact with a flat plate, for equalizing distances over which said abrasive grains protrude from said vitrified bond layer; and

firing said pattern layer and said abrasive grains which are arranged in said predetermined pattern on said working surface of said support body.

17. A method of manufacturing the vitrified bond tool as defined in claim 6, comprising the steps of:

forming a pattern layer, as a precursor of said vitrified bond layer, in a predetermined pattern on said working surface of said support body, said pattern layer including a vitrified bond which has a specific gravity smaller than that of each of said abrasive grains;

sprinkling said abrasive grains over said pattern layer before said pattern layer is dried; and

firing said pattern layer and said abrasive grains which adhere to said pattern layer and are arranged in said predetermined pattern on said working surface of said support body, such that ones of said abrasive grains each having a comparatively large size or weight sink into said pattern layer by a comparatively large distance, while ones of said abrasive grains each having a comparatively small size or weight sink into said pattern layer over a comparatively small distance, so that distances over which said abrasive grains protrude from said vitrified bond layer are equalized to each other.

18. A method according to claim 14, further comprising the step of recycling ones of said abrasive grains which do not adhere to said pattern layer, by turning said support body said working surface down and then vibrating said support body, after said abrasive grains have been sprinkled over said pattern layer.

19. A method of manufacturing the vitrified bond tool as defined in claim 1, comprising the steps of:

forming a backing layer, as a precursor of said vitrified bond layer, on said working surface of said support body, said backing layer including a vitrified bond;

forming a pattern layer, as a precursor of said vitrified bond layer, in a predetermined pattern on said backing layer, said pattern layer including a vitrified bond;

sprinkling said abrasive grains over said pattern layer before said pattern layer is dried; and

firing said backing layer, said pattern layer and said abrasive grains which adhere to said pattern layer and are arranged in said predetermined pattern on said working surface of said support body.

20. A method of manufacturing the vitrified bond tool as defined in claim 1, comprising the steps of:

forming a pattern layer, as a precursor of said vitrified bond layer, in a predetermined pattern on said working surface of said support body, said pattern layer including a vitrified bond;

sprinkling said abrasive grains over said pattern layer before said pattern layer is dried;

applying one of a paste and a slurry including a vitrified bond, on said working surface of said support body, for thereby forming a coating layer as a precursor of said vitrified bond layer, said coating layer surrounding each of said abrasive grains on said working surface of said support body; and

firing said pattern layer, said coating layer and said abrasive grains which adhere to said pattern layer and are arranged in said predetermined pattern on said working surface of said support body.